FIG. 1

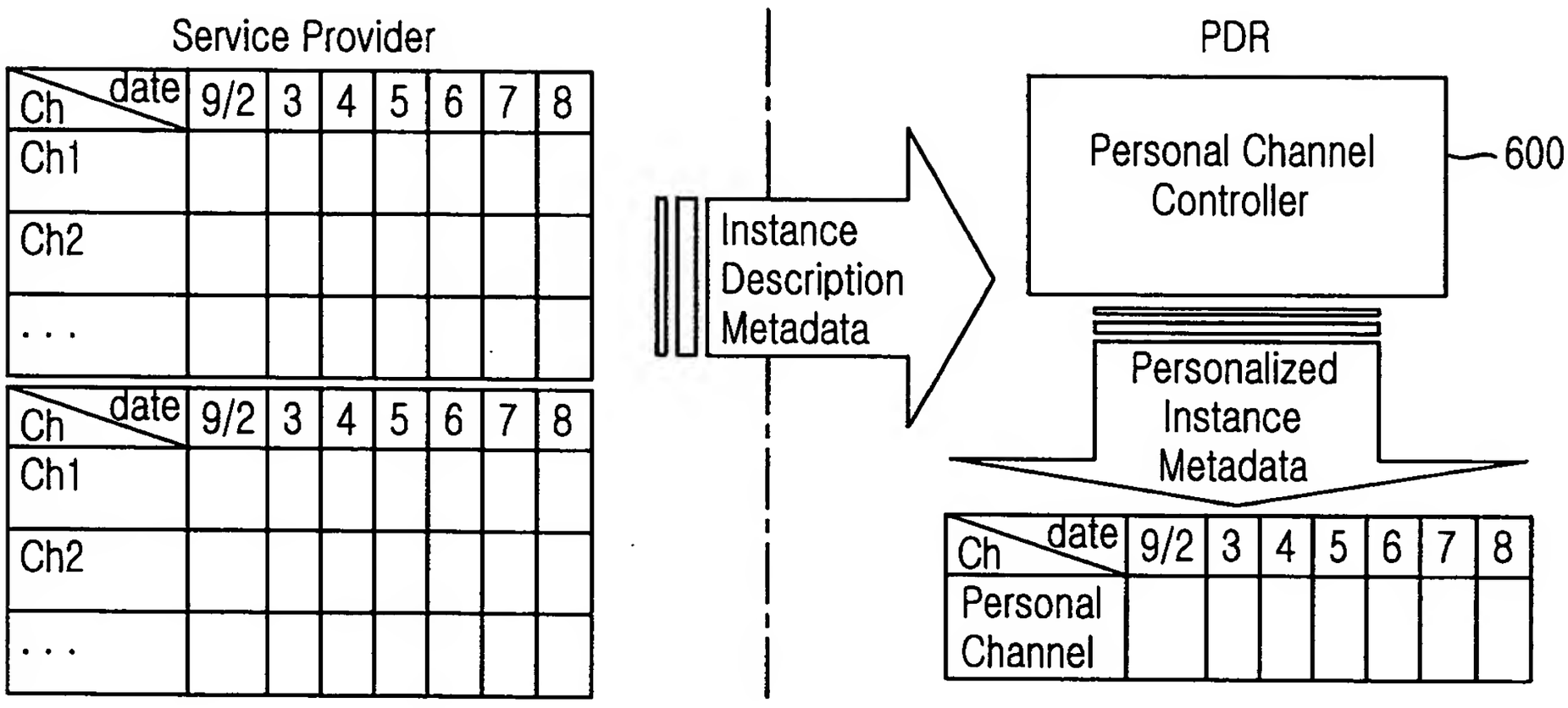
Service Provider
Ch
date
9/2
3
4
5
6
7
8
Ch1
Ch2
. . .
Instance Description Metadata
PDR
Personal Channel Controller
600
Personalized Instance Metadata
Personal Channel

FIG. 2

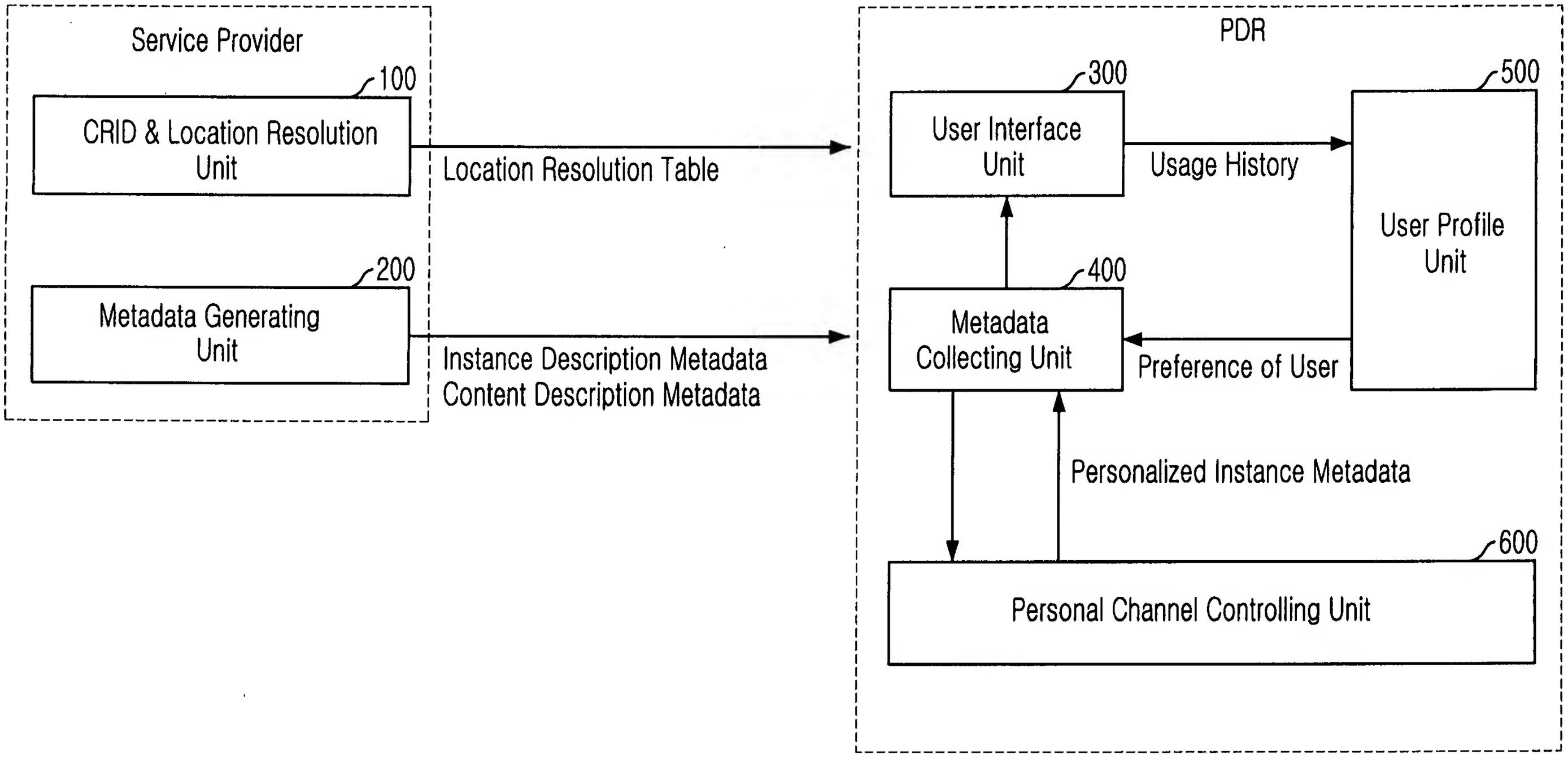
Service Provider
100
CRID & Location Resolution Unit
200
Metadata Generating Unit
Location Resolution Table
Instance Description Metadata
Content Description Metadata
PDR
300
User Interface Unit
500
User Profile Unit
Usage History
400
Metadata Collecting Unit
Preference of User
Personalized Instance Metadata
600
Personal Channel Controlling Unit

FIG. 3

```
<ProgramDescription>
    <ProgramInformationTable >
        <ProgramInformation programId="crid://imbc.com/sangdo/episode17">
            <BasicDescription>
                <Title> Sangdo_17 </Title>
                <Synopsis> The one where SangOk is embarrassed with the rumor
                </Synopsis>
                <Genre href="urn:mpeg:TVAnytime_v0.1ContentCS:2.1.1">
                    <mpeg7:Name >Drama</mpeg7:Name>
                </Genre>
            </BasicDescription>
        </ProgramInformation>
        <ProgramInformation programId="crid://imbc.com/sangdo/episode18">
            <BasicDescription>
                <Title> Sangdo_18 </Title>
                <Synopsis> The one where SangOk sold his clothes cheaply
                </Synopsis>
                <Genre href="urn:mpeg:TVAnytime_v0.1ContentCS:2.1.1">
                    <mpeg7:Name >Drama</mpeg7:Name>
                </Genre>
            </BasicDescription>
        </ProgramInformation>
    </ProgramInformationTable>
    <GroupInformationTable>
        <GroupInformation groupId="crid://imbc.com/sangdo/several"
            ordered="true" numOfItems="2"">
            <GroupType xsi:type="ProgramGroupTypeType" value="series"/>
            <BasicDescription>
                <Title>Sangdo</Title>
                <Synopsis>Several episodes of Sangdo</Synopsis>
                <Genre href="urn:mpeg:TVAnytime_v0.1ContentCS:2.1.1">
                    <mpeg7:Name>Drama</mpeg7:Name>
                </Genre>
            </BasicDescription>
        </GroupInformation>
    </GroupInformationTable>
</ProgramDescription>
```

FIG. 4

```
<ProgramDescription>
    <ProgramLocationTable>
        <BroadcastEvent>
            <Program crid="crid://imbc.com/sangdo/episode17"/>
            <BroadcastURL>dvb://1.4ee2.3f4/</BroadcastURL>
            <EventDescription>
                <PublishedTime>2002-04-22T22:00:00</PublishedTime>
                <PublishedDuration>PT50M</PublishedDuration>
            </EventDescription>
            <ServiceId id="Ch1"/>
        </BroadcastEvent>
        <BroadcastEvent>
            <Program crid="crid://imbc.com/sangdo/episode18"/>
            <BroadcastURL>dvb://1.4ee2.3f4/</BroadcastURL>
            <EventDescription>
                <PublishedTime>2002-04-23T22:00:00.00</PublishedTime>
                <PublishedDuration>PT50M</PublishedDuration>
            </EventDescription>
            <ServiceId id="Ch1"/>
        </BroadcastEvent>
    </ProgramLocationTable>
    <ServiceInformationTable>
        <ServiceInformation serviceId="Ch1">
            <Name>MBC</Name>
            <Owner>MBC</Owner>
        </ServiceInformation>
    </ServiceInformationTable>
</ProgramDescription>
```

FIG. 5

```
<UserDescription>
    <UserPreferences>
        <mpeg7:UserIdentifier>
            <mpeg7:Name xml:lang="en">etri</mpeg7:Name>
        </mpeg7:UserIdentifier>
        <mpeg7:FilteringAndSearchPreferences>
            <mpeg7:CreationPreferences>
                <mpeg7:Title preferenceValue="99">sangdo</mpeg7:Title>
            </mpeg7:CreationPreferences>
        </mpeg7:FilteringAndSearchPreferences>
        <mpeg7:FilteringAndSearchPreferences>
            <mpeg7:ClassificationPreferences>
                <mpeg7:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.1"
                    preferenceValue="80">
                    <mpeg7:Name>Drama</mpeg7:Name>
                </mpeg7:Genre>
            </mpeg7:ClassificationPreferences>
            <mpeg7:PreferenceCondition>
                <mpeg7:Time recurrence="weekly">
                    <mpeg7:TimePoint>2002-04-23T11:00</mpeg7:TimePoint>
                    <mpeg7:Duration>PT1H</mpeg7:Duration>
                </mpeg7:Time>
            </mpeg7:PreferenceCondition>
        </mpeg7:FilteringAndSearchPreferences>
    </UserPreferences>
</UserDescription>
```

FIG. 6

```
<ProgramDescription>
    <ProgramLocationTable>
        <BroadcastEvent>
            <Program crid="crid://imbc.com/sangdo/episode18"/>
            <BroadcastURL>dvb://1.4ee2.3f4/</BroadcastURL>
            <EventDescription>
                <PublishedTime>2002-04-16T22:00:00.00</PublishedTime>
                <PublishedDuration>PT50M</PublishedDuration>
            </EventDescription>
            <ServiceId id="Ch1" />
        </BroadcastEvent>
        <BroadcastEvent>
            <Program crid="crid://imbc.com/sangdo/episode18"/>
            <BroadcastURL> My_PDR/personal/</BroadcastURL>
            <EventDescription>
                <PublishedTime>2002-04-20T11:00:00.00</PublishedTime>
                <PublishedDuration>PT50H</PublishedDuration>
            </EventDescription>
            <ServiceId id="Ch2" />
        </BroadcastEvent>
    </ProgramLocationTable>
    <ServiceInformationTable>
        <ServiceInformation serviceId="Ch1">
            <Name>MBC</Name>
            <Owner>MBC</Owner>
        </ServiceInformation>
        <ServiceInformation serviceId="Ch2">
            <Name> PERSONAL </Name>
            <Owner>My_PDR</Owner>
        </ServiceInformation>
    </ServiceInformationTable>
</ProgramDescription>
```

FIG. 7

```
<UserDescription>
    <UsageHistory id="usage-history-001" allowCollection="true">
        <mpeg7:UserIdentifier protected="true">
            <mpeg7:Name xml:lang="en">etri</mpeg7:Name>
        </mpeg7:UserIdentifier>
        <mpeg7:UserActionHistory protection="false">
            <mpeg7:ObservationPeriod>
                <mpeg7:TimePoint>2002-04-18T10:00</mpeg7:TimePoint>
                <mpeg7:Duration>PT3H</mpeg7:Duration>
            </mpeg7:ObservationPeriod>
            <mpeg7:UserActionList id="ua-list-001"
                numInstances="1" totalDuration="PT20M">
                <mpeg7:ActionType href=" urn:mpeg:mpeg7:cs:ActionTypeCS:2001:3.4">
                    <mpeg7:Name>ViewGuide</mpeg7:Name>
                </mpeg7:ActionType>
                <mpeg7:UserAction>
                    <mpeg7:ActionTime>
                        <mpeg7:MediaTime>
                            <mpeg7:MediaTimePoint>
                                2002-04-18T10:05:00
                            </mpeg7:MediaTimePoint>
                            <mpeg7:MediaDuration>PT00H20M
                            </mpeg7:MediaDuration>
                        </mpeg7:MediaTime>
                    </mpeg7:ActionTime>
                    <mpeg7:ProgramIdentifier organization="TVAF" type="CRID">
                        crid://imbc.com/sangdo/several
                    </mpeg7:ProgramIdentifier>
                </mpeg7:UserAction>
            </mpeg7:UserActionList>
        </mpeg7:UserActionHistory>
    </UsageHistory>
</UserDescription>
```

FIG. 8

```
<ContentReferencingTable>
    <Result CRID="crid://imbc.com/sangdo/episode18" status="resolved" complete="true"        acquire="any">
            <LocationsResult>
                <Locator>
                        dvb://1.4ee2.3f4:4f5@2002-04-16T22:00:00.00/PT00H50M
                </Locator>
                <Locator>
                        My_PDR/personal/sangdo18@2002-04-20T11:00:00.00/PT00H50M
                </Locator>
            </LocationsResult>
    </Result>
</ContentReferencingTable>
```

FIG. 9

SQL Server Enterprise Manager-[2:Data of 'Usage History' Table('TVAConsumerMetadata'Database, 'LHK95'Computer)]

Console(C) Window(W) Help(H)

UserI dentifier	Observed Date	Observed Duration	numC	Total Duration	Action Type Nam	Action Type ID	Program ID	Action	Brow	Query	Action Media Date	Action Media Dur	Action General Date
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	Sangdo	1970-01-01 am 9:00	0	2002-08-27 pm 5:02:48
User 1	2002-08-27 pm	56	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00	9	2002-08-27 pm 5:02:45
User 1	2002-08-27 pm	57	0	0	Search	3.7			0	Sangdo	1970-01-01 am 9:00	0	2002-08-27 pm 5:07:08
User 1	2002-08-27 pm	57	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00	12	2002-08-27 pm 5:07:01
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	QUESTION	1970-01-01 am 9:00	0	2002-08-27 pm 5:09:19
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	QUERY	1970-01-01 am 9:00	0	2002-08-27 pm 5:09:29
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	EVENT	1970-01-01 am 9:00	0	2002-08-27 pm 5:09:34
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	DESCRIPTION	1970-01-01 am 9:00	0	2002-08-27 pm 5:09:43
User 1	2002-08-27 pm	56	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00	34	2002-08-27 pm 5:09:13
User 1	2002-08-27 pm	57	0	0	Search	3.7			0	Kim, Gu-Sun	1970-01-01 am 9:00	0	2002-08-27 pm 5:13:01
User 1	2002-08-27 pm	57	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00	12	2002-08-27 pm 5:12:53
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	Kim, So-Wol	1970-01-01 am 9:00	0	2002-08-27 pm 5:16:02
User 1	2002-08-27 pm	56	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00	13	2002-08-27 pm 5:15:53
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	Kim, So-Wol	1970-01-01 am 9:00	0	2002-08-27 pm 5:38:15
User 1	2002-08-27 pm	56	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00	10	2002-08-27 pm 5:38:11
User 1	2002-08-27 pm	56	0	0	Search	3.7			0	Kim, So-Wol	1970-01-01 am 9:00	0	2002-08-27 pm 5:40:04
User 1	2002-08-27 pm	56	0	0	PlayRecording	1.1	crid://www.kbs1.co.kr/novel200100389		1		1970-01-01 am 9:00	1	2002-08-27 pm 7:13:39
User 1	2002-08-28 am	56	0	0	PlayRecording	1.1	crid://www.kbs2.co.kr/dongsuh200100444		1		1970-01-01 am 9:00	1	2002-08-28 am 9:12:56
User 1	2002-08-27 pm	56	0	0	ViewGuide	3.4	crid://www.imbc.com/lover200100752		0		1970-01-01 am 9:00	0	2002-08-27 pm 7:14:03

FIG. 10

Date Preference DB

User ID	Date	Preference Value	Real Time	Stored
Hong, Gil-Dong	SUN 00	88	3	2
	SUN 01	22		
	MON 00	22		
	MON 01	-10		
	MON 02			

User ID	Date	Preference Value	Watched Duration
Hong, Gil-Dong	SUN 00	DRAMA	40
		NEWS	20
		SPORTS	0
	SUN 01		
	MON 00	90	
	MON 01	50	
	MON 02		

FIG. 11

Filtering & Search Preference Table

Field	Type of Data	Example
User Identifier	Textual Type	Hong, Gil-Dong
Preference Value	Interger	-100~+100
Title	Textual Type	Sangdo: Life of Ginseng Merchant
Genre	Textual Type	DRAMA
Genre ID	Genre·Classification·Number	2.1.1
Preferred Date	Textual Type	2002-04-15 MON pm 11:00:00
Preferred Duration	Unsigned Integer	60(Minute)

FIG. 12A

ETRI 2002-01-17 Program information

Everyday with You -34th Episode-

Story of two women having closely
located houses of family-in-law but emotionally far

Genre: Drama

7

Channel	Broadcasting Station	Time	Title of Program	Save
2	KBS2	20:25-20:55	This Is Love -39th-	
4	SBS	20:20-20:55	Everyday With You -34th-	
4	SBS	20:55-21:50	MBC News Desk	
5	EBS	20:40-20:45	Sports of Today	

FIG. 12B

ETRI 2002-01-17 Group information

Sangdo: Life of Ginseng Merchant

This drama shows what a real entrepreneur should be like and what economic justice is

Genre: Drama

7

Channel	Broadcasting Station	TIME	Title of Program	Save
3	MBC	22:05-23:05	Sangdo -17th-	
3	MBC	22:05-23:05	Sangdo -18th-	
3	MBC	22:05-23:05	Sangdo -19th-	
3	MBC	22:05-23:05	Sangdo -20th-	

FIG. 13

Syntax	Definition
Series	A set of programs having a word order (e.g., hourglass) or having no word order (e.g., Tom & Jerry). If a program does not have a predetermined number of broadcasting (e.g., Amateur Singing Contest), the program is regarded as series
Show	Entire themes of series (e.g., all subjects and titles of Tom & Jerry)
Program Concept	Concept of editor on characteristics, versions and generation of a program
Magazine	A group of sub-programs for each event, e.g., sports
Program Compilation	A set of segments from many programs
Other Collection	An arbitrary group other than defined list. When a group is selected, all programs of the group are acquired
Other Choice	An arbitrary group other than defined list. When a group is selected, one program of the group is acquired

FIG. 14

Genre	Group Type	Option	Example	Notes
Drama	Series	Ordered	crid://www.sbs.co.kr/womanwide	Drama with identical title
News	Series	Ordered by Publication Date	crid://www.imbc.com/newsdesk	News with identical title
Sports	Series	Ordered by Publication Date	crid://www.imbc.com/sportsnews	Sub-programs exist within a sports program => sub-programs of series are not independent from each other
	Magazne	Ordered by Publication Date	crid://www.imbc.com/sportsnews	
Documentary	Series	Ordered by Publication Date	crid://www.kbs1.co.kr/beautykorea	Documentary program with identical title
Education	Series	Ordered by Publication Date	crid://www.ebs.co.kr/dingdong	Education program with identical title
Science	Series	Ordered by Publication Date	crid://www.ebs.co.kr/science	Science program with identical title
Music	Series	Ordered by Publication Date	crid://www.kbs2.co.kr/singstar	Music Program With Identical Title
Entertainments	Series	Ordered by Publication Date	crid://www.imbc.com/comedyhuse	Entertainment program with identical title
Show	Series	Ordered by Publication Date	crid://www.sbs.co.kr/morningwide	Show program with identical title

FIG: 15

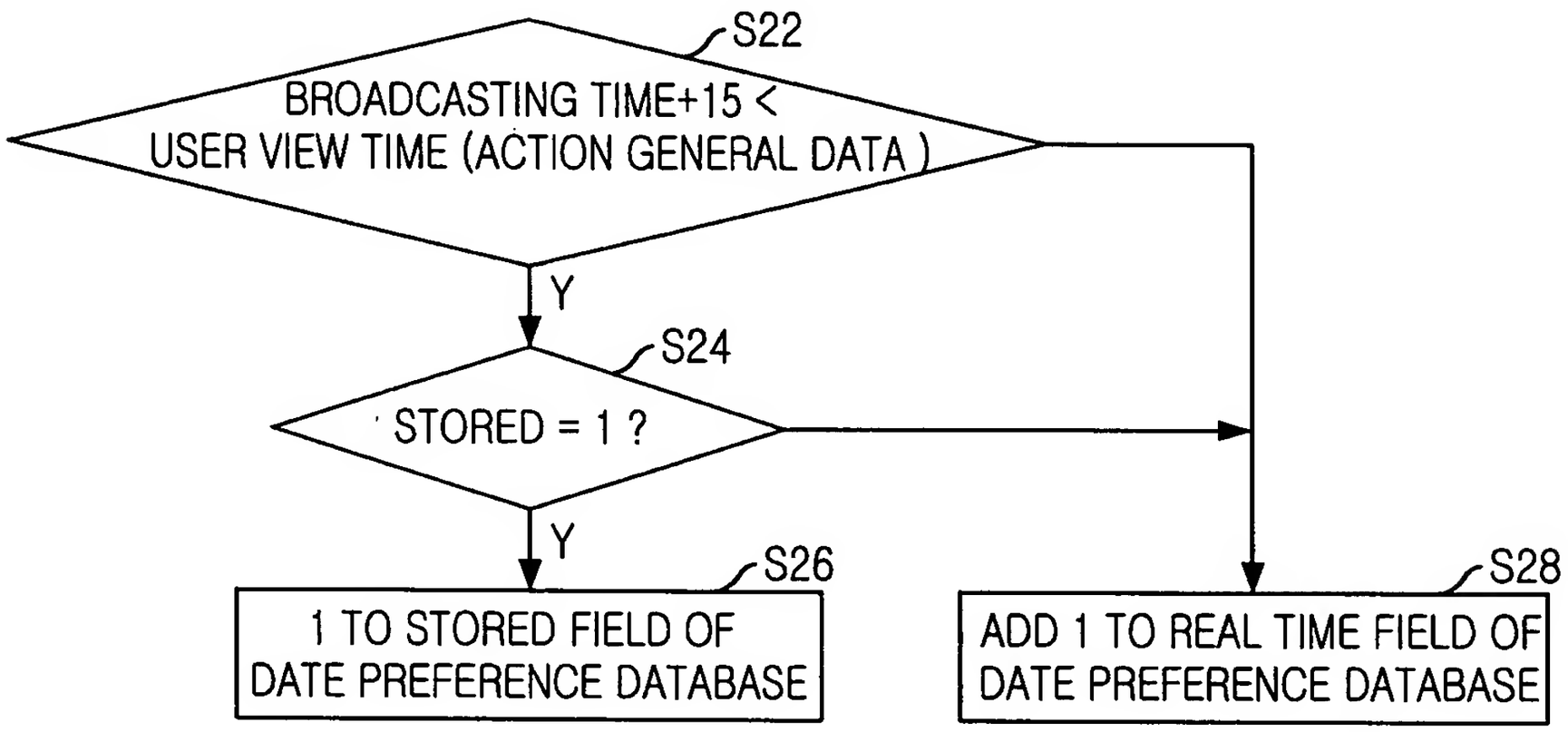
S22
BROADCASTING TIME+15 <
USER VIEW TIME (ACTION GENERAL DATA)
Y
S24
STORED = 1 ?
Y
S26
1 TO STORED FIELD OF
DATE PREFERENCE DATABASE
S28
ADD 1 TO REAL TIME FIELD OF
DATE PREFERENCE DATABASE

FIG. 16

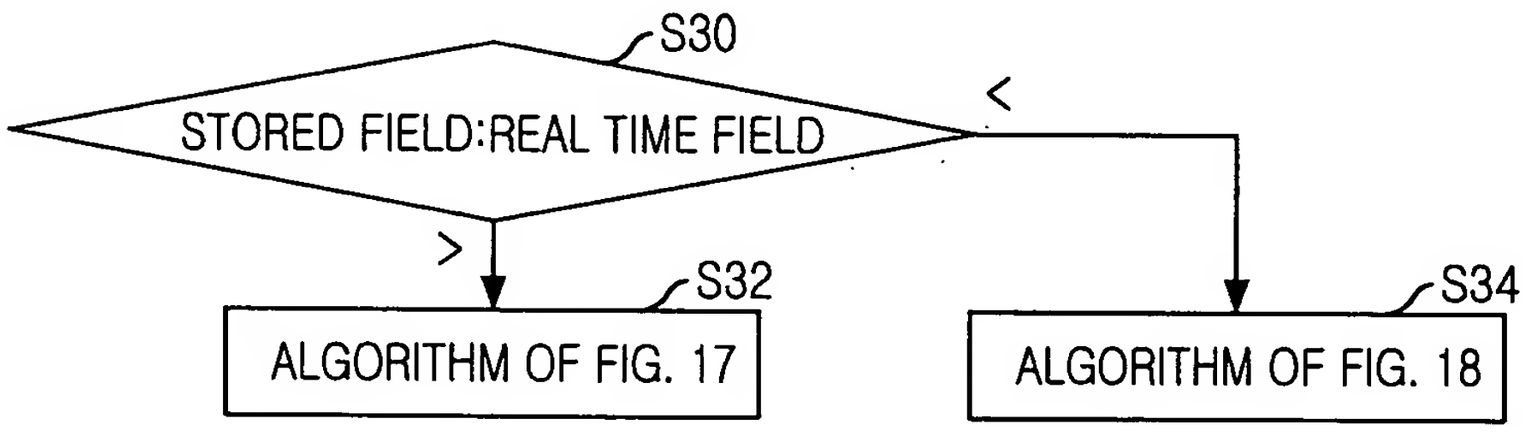
S30
STORED FIELD:REAL TIME FIELD
<
>
S32
ALGORITHM OF FIG. 17
S34
ALGORITHM OF FIG. 18

FIG. 17

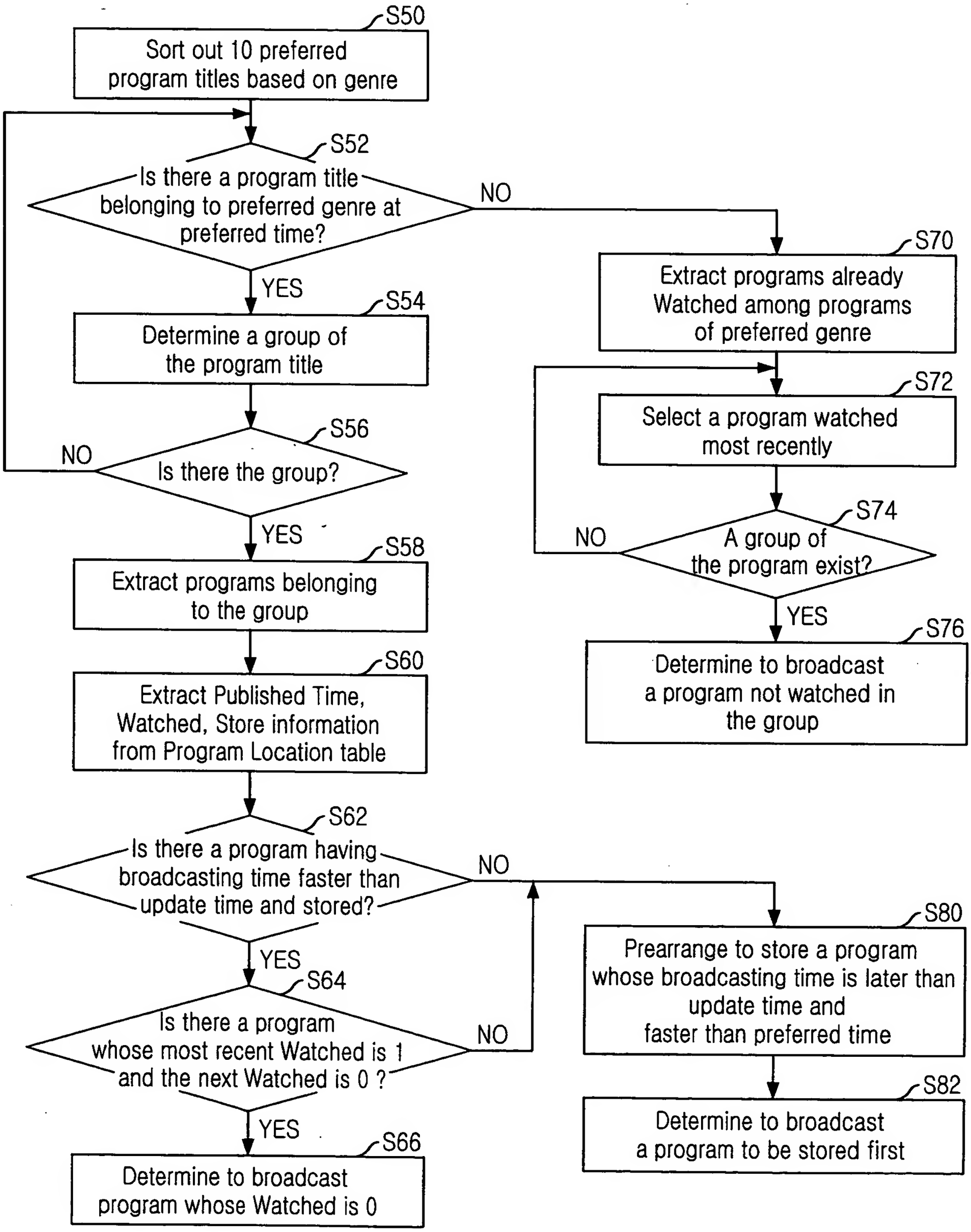
S50
Sort out 10 preferred program titles based on genre
S52
Is there a program title belonging to preferred genre at preferred time?
NO
YES
S54
Determine a group of the program title
S56
Is there the group?
NO
YES
S58
Extract programs belonging to the group
S60
Extract Published Time, Watched, Store information from Program Location table
S62
Is there a program having broadcasting time faster than update time and stored?
NO
YES
S64
Is there a program whose most recent Watched is 1 and the next Watched is 0 ?
NO
YES
S66
Determine to broadcast program whose Watched is 0
S70
Extract programs already Watched among programs of preferred genre
S72
Select a program watched most recently
S74
A group of the program exist?
NO
YES
S76
Determine to broadcast a program not watched in the group
S80
Prearrange to store a program whose broadcasting time is later than update time and faster than preferred time
S82
Determine to broadcast a program to be stored first

FIG. 18

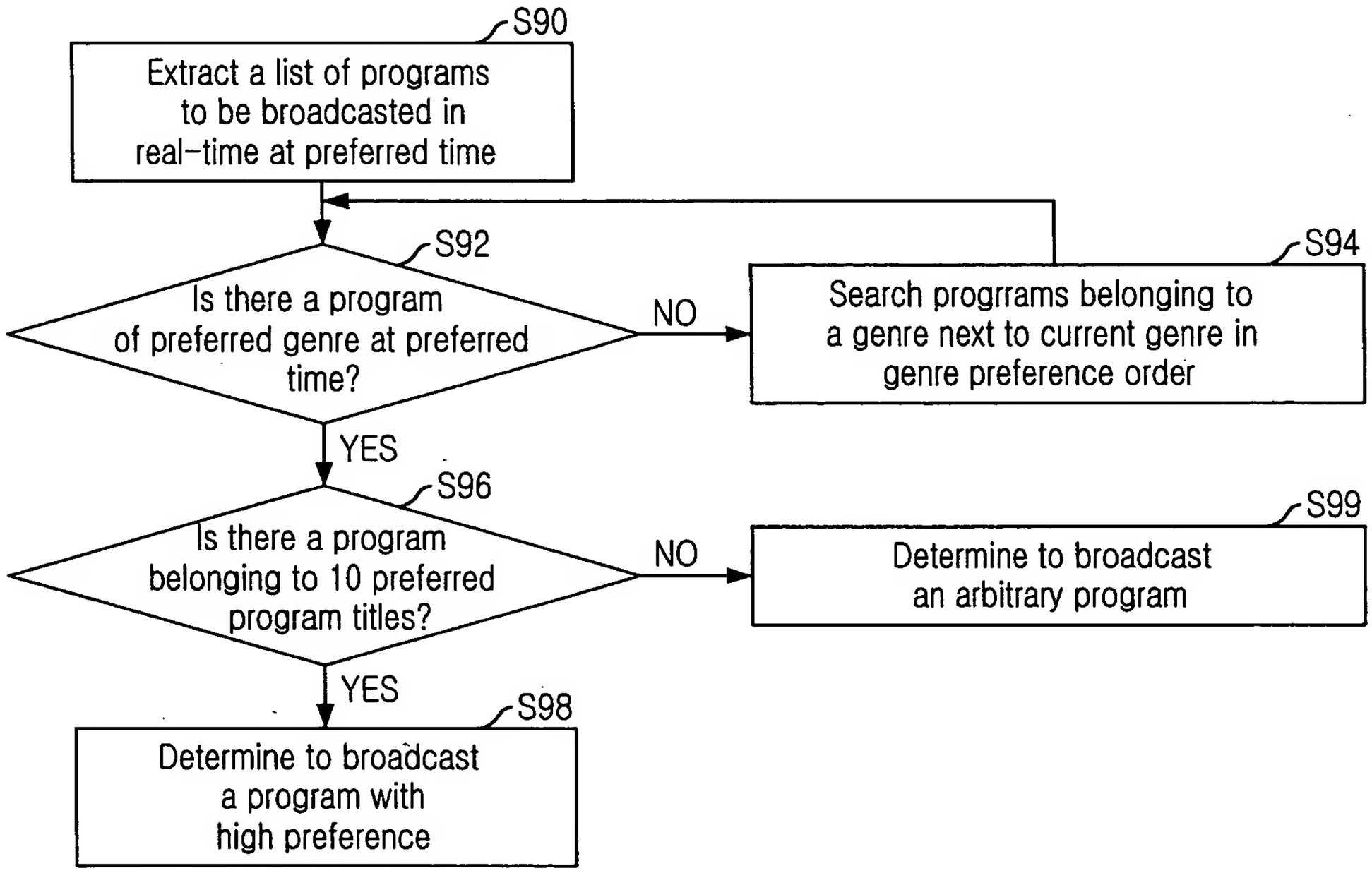
S90
Extract a list of programs to be broadcasted in real-time at preferred time
S92
Is there a program of preferred genre at preferred time?
NO
S94
Search progrrams belonging to a genre next to current genre in genre preference order
YES
S96
Is there a program belonging to 10 preferred program titles?
NO
S99
Determine to broadcast an arbitrary program
YES
S98
Determine to broadcast a program with high preference

FIG. 19

VALUE	MEANING
0	NOT WATCHED
1	WATCHED

FIG. 20

VALUE	MEANING
0	SUNDAY
1	MONDAY
2	TUESDAY
3	WEDNESDAY
4	THURSDAY
5	FRIDAY
6	SATURDAY

FIG. 21

VALUE	MEANING
0	NOT STORED
1	STORED

FIG. 22

Service ID	Valid Time	Valid Period	Name	Owner	Logo
2	2001-11-08 10:00	2880	KBS1	KBS	Logo
3	2001-11-09 15:00	2880	KBS2	KBS	Logo
4	2001-11-10 18:00	2800	MBC	MBC	Logo
5	2001-11-15 09:00	2800	SBS	SBS	Logo
6	2001-11-14 12:00	2880	EBS	EBS	Logo
7	2001-11-12 10:00	2880	PERSONAL	MY_PDR	Logo

FIG. 23

Program ID	Version	Title	Synopsis	Published Time	Published Duration	Live	Repeat	First Showing	Last Showing	PPV	URL	Service ID	Day	Store	Watched
crid://www.sbs.co.kr/womanworld18	16	Women World -90th-	Born as a daughter of a mistress~	2000-08-16 pm 08:00	60	0	0	0	0	0	crid://www.sbs.co.kr	1 (Personal)	6 (Saturday)	1	0
crid://www.sbs.co.kr/womanworld18	16	Women World -90th-	Born as a daughter of a mistress~	2000-08-15 pm 11:00	60	0	0	0	0	0	crid://my_PDR/personal	5	5 (Friday)	1	0